Basics of PowerShell Looping: Foreach

The Scripting Guys (https://social.technet.microsoft.com/profile/The+Scripting+Guys) April 28, 2014

11 (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comments)

Summary: Microsoft Scripting Guy, Ed Wilson, talks about using the Windows PowerShell **Foreach** statement to loop through a collection.

Microsoft Scripting Guy, Ed Wilson, is here. When the Scripting Wife and I were in Amsterdam, Windows PowerShell MVP, Jeff Wouters, told me that a lot of people he ran across had problems looping through collections with Windows PowerShell. Here is a picture of Jeff and me.

(https://msdnshared.blob.core.windows.net/media/TNBlogsFS/prod.evol.blogs.technet.com/CommunityServer.Blogs.Components.Web

Basics of looping

Looping is a fundamental Windows PowerShell concept. Actually, I take that back. It is a fundamental concept of any programing language, even batch languages. So what is the problem?

Most people coming to Windows PowerShell for the first time understand about variables. For example, if I store a value in a variable, and if I want to get at that value, it is no problem. I address the variable as shown here:

```
PS C:\> $a = 5
PS C:\> $b = 6
PS C:\> $c = 7
PS C:\> $a
5
PS C:\> $b
6
PS C:\> $c
7
```

One thing that makes Windows PowerShell easy to use, is that it automatically unravels arrays. An array is when I add more than one thing to a variable. For example, earlier I assigned three values to three variables. Now, I want to add those three variables to a single variable. So I will use **$d** to hold an array comprised of **$a**, **$b**, and **$c**. In Windows PowerShell, it is easy to see the values. I just call the variable as shown here:

```
PS C:\> $d = $a,$b,$c

PS C:\> $d

5

6

7
```

I can also access the values of the variables by position in the array. The first position is [0], and the last position in our array is [2]. So I can access specific elements from the array by using the position numbers. This is shown here:

```
PS C:\> $d[0]

5

PS C:\> $d[1]

6

PS C:\> $d[2]

7

PS C:\>
```

Walking through the array

Suppose I want to add the number five to each of the three values I have in **$a**, **$b**, and **$c**. If I work with them individually, it is easy. I just do the following:

```
PS C:\> $a + 5

10

PS C:\> $b + 5

11

PS C:\> $c + 5

12

PS C:\>
```

The problem comes with the values I have in my array that is in the **$d** variable. In Windows PowerShell, if I add 5 to my **$d** variable, I end up actually adding the value as another element in the array. This is shown here:

```
PS C:\> $d + 5

5

6

7

5
```

To add the number five to each of the elements in the array, I need to walk through the array by using the **Foreach** command. To use the **foreach** command, I need to do three things:

1. I call the **Foreach** command.
2. I use a pair of parentheses, I use a variable for my place holder (enumerator), and I use the variable that is holding the collection.
3. I use a pair of curly braces (script block) that includes the script that does what I want to do.

The placeholder variable I use represents the current item from the collection that I will be working with. The variable only gets a value inside the script block, and it will always be a different item each time I loop through the collection. The **Foreach** command is shown here:

```
Foreach (placeholder variable IN collection)

{

  What I want to do to the placeholder variable

}
```

In my example, the **Foreach** command is shown here:

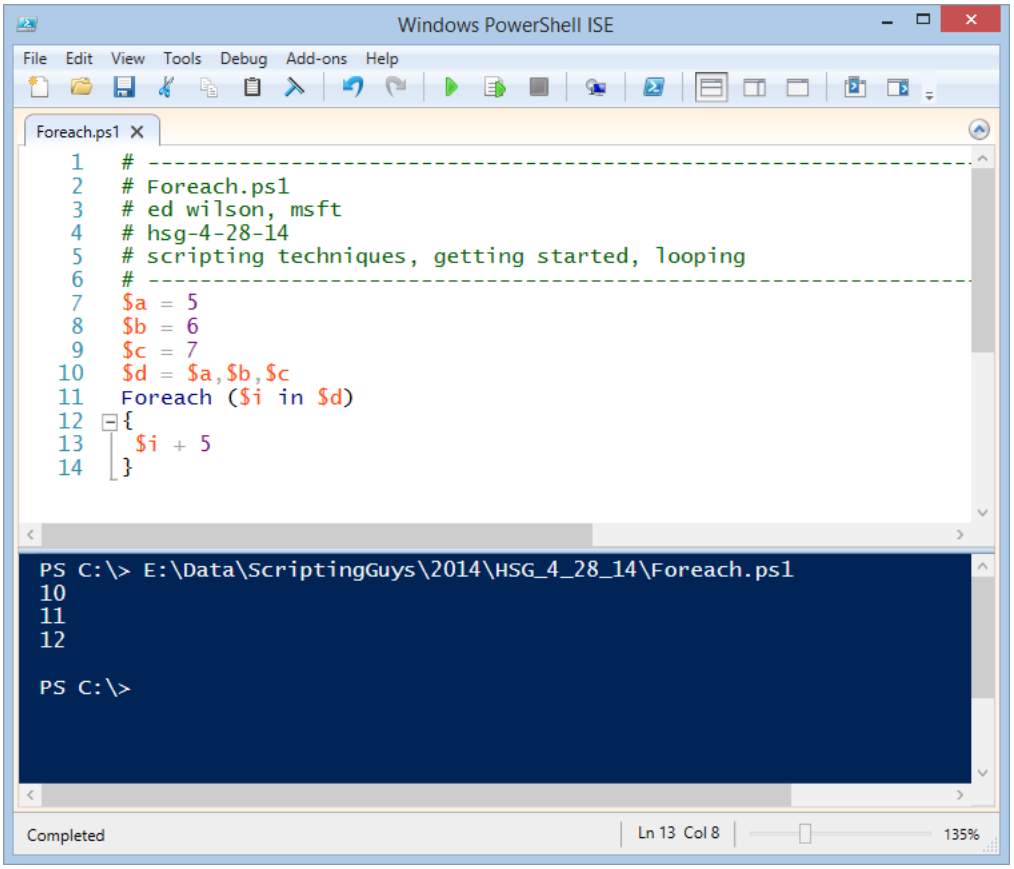
```
Foreach ($i in $d)

{

 $i + 5
```

```
}
```

Here's the entire script:

```
$a = 5
$b = 6
$c = 7
$d = $a,$b,$c
Foreach ($i in $d)
{
 $i + 5
}
```

The command and the output from the command are shown in the following image:



(https://msdnshared.blob.core.windows.net/media/TNBlogsFS/prod.evol.blogs.technet.com/CommunityServer.Blogs.Components.Web
4-28-14-02.png)

That is all there is to using **Foreach** to loop through a collection. Looping Week will continue tomorrow when I will talk about using **Foreach-Object** in the pipeline.

I invite you to follow me on Twitter (http://bit.ly/scriptingguystwitter) and Facebook (http://bit.ly/scriptingguysfacebook). If you have any questions, send email to me at scripter@microsoft.com (mailto:scripter@microsoft.com), or post your questions on the Official Scripting Guys Forum (http://bit.ly/scriptingforum). See you tomorrow. Until then, peace.

Ed Wilson, Microsoft Scripting Guy

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Vidyasagar Machupalli (https://social.technet.microsoft.com/profile/Vidyasagar+Machupalli)
October 15, 2018 at 8:40 am (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121493)
Good ps1 script about looping…Thanks

Reply (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121493#respond)

Anonymous
October 15, 2018 at 8:40 am (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121503)
In this example '$i' is just a placeholder.

It's just a variable named ' I ' .

You could call it : "$AnyThingYouLike"

Reply (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121503#respond)

Anonymous
October 15, 2018 at 8:40 am (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121513)
Now that's a great starters example for everyone who wants to learn looping in PowerShell.

Maybe you could explain to everyone (inc. Jeff 😉) what the difference is between foreach and foreach-object.

Reply (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121513#respond)

Victor Ashiedu (https://social.technet.microsoft.com/profile/Victor+Ashiedu)
October 15, 2018 at 8:40 am (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121523)
ForEach is very useful but I'll like to know the difference with ForEach-Object

Reply (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121523#respond)

Joe
April 28, 2014 at 4:14 pm (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121543)
Does it need to say Foreach ($i in $d)? Where does the "$i" come from? I understand in C and C++ you have to declare it in a loop, (i=0, i>10,i++). I am not sure where and how the $i works in powershell yet.

Reply (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121543#respond)

Joe
April 29, 2014 at 12:09 am (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121473)
Thanks Gaff, so you never have to declare it? you can just use whatever you want as long as you reference the name of the array?

Reply (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121473#respond)

markus
May 10, 2014 at 8:23 am (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121553)
Do I need to declare a variable first to ne able to usw a Foreach-Object cmdlet?
Can I usw for example: get-moverequest | select identity | % {get-moverequeststatistics}
In that example, the mandatory Parameter "identity" isn't parsed to the get-moverequeststatistics…. But why?

Reply (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121553#respond)

zalek
November 13, 2014 at 11:21 pm (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121533)
why the output file was not changed? Here is my code:

```
$batch = Get-Content $file
foreach ($l in $batch)
{
if ($l.StartsWith('02 '))
{$l = '05 ' + $l.Substring(3)}
}

Set-Content $outFile $batch
```

The output file was the same as the input file, but the code changes '02 ' to '05 '.

Thanks,

Zalek

Reply (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121533#respond)

JoeT
January 28, 2015 at 11:11 pm (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-121483)
I'm totally new to PS. I'm trying to reset all 18K user account password to a uniquely generated password for each account that I have populated in a .csv file.

Here's the script that I'm using but I got the following error message – "Unexpected token 'in' in expression or statement". What did I do wrong? Thanks in advance for helping!

```
connect-msolservice

$Users = Import-Csv C:UsersxxxDocumentspasswordTest.csv
foreach($User in $Users){
set-msoluserpassword -userprincipalname $User.UserPrincipalName -newpassword $User.NewPassword
}
```

Reply (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=121483#respond)

vishnu
July 27, 2015 at 1:27 pm (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-150001)
Greatttt . I am just a beginner. i was struggling to get the concept of this. This helped me lot.
Thanks,

Reply (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=150001#respond)

James III
January 5, 2016 at 6:29 pm (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/#comment-167261)
Isn't easier to write the script as follows:

```
$digits = 2,3,4,5
foreach($digit in $digits) {
$digit + 3
}
```

Reply (https://blogs.technet.microsoft.com/heyscriptingguy/2014/04/28/basics-of-powershell-looping-foreach/?replytocom=167261#respond)

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Related Resources

Script Center Home (http://technet.microsoft.com/en-us/scriptcenter/default.aspx)

Scripting Library (http://technet.microsoft.com/en-us/library/cc498722.aspx)

Learn to Script (http://technet.microsoft.com/en-us/scriptcenter/dd793612.aspx)

Script Repository (http://www.microsoft.com/technet/scriptcenter/scripts/default.mspx?mfr=true)

Scripting Forum (http://social.technet.microsoft.com/Forums/en-US/ITCG/threads)

2012 Scripting Games (http://blogs.technet.com/b/heyscriptingguy/archive/2012/02/04/the-2012-windows-powershell-scripting-games-all-links-on-one-page.aspx)

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